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SUMMARY OF TRADE AND TARIFF INFORMATION

Prepared in Terms of the Tariff Schedules of the United States

UNMOUNTED OPHTHALMIC LENSES

TSUS Item 708. 01

USITC PUBLICATION 841
CONTROL NO. 7-2-6
OCTOBER 1978

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United States International Trade Commission / Washington, D.C. 20436

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U.S. INTERNATIONAL TRADE COMMISSION RELEASES A SUMMARY ON OPHTHALMIC LENSES AS ONE OF A SERIES OF SUMMARIES OF TRADE AND TARIFF INFORMATION

Information on U.S. imports, exports, and production and on world trade in ophthalmic lenses became available today as the United States International Trade Commission released another report in its in-depth series of summaries of trade and tariff information initiated last year.

The summaries of trade and tariff information are designed to meet the needs of wide and varied interests, including the Congress, the courts, Government agencies, importers, domestic producers, research organizations, and many others. The summaries contain accurate descriptions, in terms of the tariff schedules, of the thousands of products imported into the United States, and information on their methods of production, world supplies, and importance in trade and in the U.S. economy. The summaries also include substantive analytical material with regard to the basic factors affecting trends in consumption, production, and trade, and factors bearing on the competitive position and economic health of domestic industries.

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This report is being distributed to various Government agencies, congressional committees, and interested members of the public. In addition, as a service to the public, the field offices of the Department of Commerce and selected public and university libraries in large cities will be supplied with copies for commercial and professional consultation. Copies of the report (USITC Publication 841, Control No. 7-2-6) can be obtained by calling (202) 523-5178 or from the Office of the Secretary, 701 E St. NW., Washington, D.C. 20436.

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UNITED STATES INTERNATIONAL TRADE COMMISSION

SUMMARY OF TRADE AND TARIFF INFORMATION

Prepared in Terms of the
Tariff Schedules of the United States

Unmounted Ophthalmic Lenses

TSUS item 708.01

USITC PUBLICATION 841
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V

Tariff Schedules of the United States

Schedule 1 – Animal and Vegetable Products

Schedule 2 – Wood and Paper; Printed Matter

Schedule 3 – Textile Fibers and Textile Products

Schedule 4 – Chemicals and Related Products

Schedule 5 – Nonmetallic Minerals and Products

Schedule 6 – Metals and Metal Products

Schedule 7 – Specified Products; Miscellaneous and Nonenumerated Products

Schedule 8 – Special Classification Provisions

FOREWORD

Each Summary of Trade and Tariff Information is part of a series published periodically by the United States International Trade Commission to provide information on conditions of competition between domestic and foreign products. It includes data on trade and development of U.S. industries. This report, covering the period 1967 through 1977, represents one of many being published in the current series of summaries.

This series provides comprehensive coverage of product uses, manufacturing processes, and commercial practices, and provides analysis of the numerous factors affecting U.S. and world trade in each commodity area. The summaries are cast in terms of the eight schedules of the Tariff Schedules of the United States (TSUS).

The current series will consist of approximately 1,000 individual reports published in looseleaf form, which will enable the Commission to issue updated pages as appropriate for individual summaries. The overall program will run several years, ultimately covering all items of the TSUS.

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Executive Summary

This summary includes all types of unmounted ophthalmic lenses, including contact lenses. By far the most important of the lenses discussed herein are those used to correct defective vision. Also included, however, are nonfocus lenses, which are used in the manufacture of sunglasses, goggles, and similar articles.

Although there are believed to be more than 75 U.S. producers, the domestic ophthalmic lens industry is dominated by two firms which account for a major share of total domestic output. These two firms specialize in corrective lenses, and are known to have extensive overseas operations. In the nonfocus lens industry four U.S. firms supply about 90 percent of the market.

The largest shares of U.S. imports and exports consist of corrective lenses. Exports consist principally of the multifocal-type lenses and in recent years equaled about 9 percent of annual shipments.

From 1967 to 1977, apparent U.S. consumption of ophthalmic lenses rose by approximately 121 percent, from $137.3 million to an estimated $304.0 million. While U.S. shipments increased sharply during this period, imports' share of the market increased from 1 percent to more than 7 percent.

The two largest foreign producing countries are West Germany and France. Other countries with significant production of ophthalmic lenses are Japan, the United Kingdom, Spain, and Australia. Several foreign manufacturers have subsidiaries, sales offices, and wholesale laboratories in the United States.

Description and Uses

Commodity	TSUS item
Lenses, ophthalmic, not mounted--------	708.01

Note.—For the statutory description see excerpt from the Tariff Schedules of the United States Annotated (1978) in app. A.

Description

The lenses covered by this summary are ophthalmic lenses, i.e., lenses which are designed to correct visual defects and nonfocus lenses, which are used in the manufacture of sunglasses, goggles, and other similar articles. For tariff purposes, these lenses are entered under item 708.01 of the Tariff Schedules of the United States (TSUS). Lenses other than ophthalmic (included under TSUS items 708.21-708.23) and glass lens blanks (included under TSUS item 540.63) will be the subject of other summaries and are not included here. There are two types of ophthalmic lenses, conventional and contact lenses. Conventional lenses are those which are mounted into frames, whereas contact lenses are placed directly onto the eye. There are two-kinds of contact lenses, hard and soft, both of which are made exclusively of plastics.

There are many varieties of ophthalmic lenses, ranging from the least expensive colored or tinted lenses used in ready-to-wear sunglasses and goggles to the more expensive prescription types, including single-vision, bifocal, and trifocal lenses used in corrective eyeglasses. Most single-vision lenses are used to correct vision at a single distance, while multifocal lenses have refractive powers for seeing at two (bifocal) or three (trifocal) distance ranges.

Ophthalmic lenses are made from either glass or plastic. In recent years, there has been a significant increase in the application of plastics to ophthalmic lenses. Today, about 40 percent of all corrective lenses and almost all nonfocus lenses are made of plastic. This increase is partially due to the rising use of contact lenses, which are made exclusively of plastics. In addition, greater resiliency and lighter weight make plastic more desirable than glass in eyeglasses.

Manufacturers convert glass and plastic raw materials into two types of lenses, finished and semifinished. Several of the large manufacturers produce their own glass and plastics, while others obtain these products from outside sources. Finished lenses are ground by the manufacturer to specific refractive powers on both the front and back surfaces. They are ready for the consumer after the edges have been ground by the optical laboratory to fit into specific frames. The manufacturer grinds the curvature of only one lens side to produce semifinished lenses. The wholesale laboratories complete any additional work needed on the lenses before they reach the retailer. 1/

1/ Federal Trade Commission, Bureau of Consumer Protection, Report on Advertising of Ophthalmic Goods and Services, May 1977.

The production process

A high measure of precision must be maintained in the production of ophthalmic lenses to insure that the lenses do not contain any defects, the slightest of which would be noticeable to the human eye. These exact standards are necessary if the corrective eyeglasses are to be worn with a maximum of comfort. This standardization, coupled with a high demand pattern, permits the ophthalmic lens industry to adopt modified mass production techniques, with consequent economies of scale and the utilization of specialized equipment. These factors identify the industry as capital intensive.

Glass process.--Glass lenses are formed by uniting various mixtures of raw materials at high temperatures by means of fusion or melting. The main constituent of all ophthalmic glass is sand or silica. Lime, lead, barium, or zinc is fused with sand to increase the durability of the glass. The raw materials are weighed out according to a formula that gives the desired properties sought in the finished glass. After the materials are thoroughly mixed, either by hand or by a mechanical mixer, a small amount of previously rejected glass of the same type is added. The mixture is then put in a pot and exposed to intensive heat for approximately 22 hours. The molten glass is poured onto a large cast-iron table and rolled into a sheet, usually 3/8 inch in thickness. The fluid glass becomes hard almost immediately, but the cooling process continues for an additional 8 hours until room temperature is reached. The finished sheets are cut into small pieces and checked against the requirements for high-grade ophthalmic glass.

The glass is then machine ground on one or both sides, using several different grades of abrasive materials, including iron oxide. The abrasive materials act as cutters, removing rough edges and deep holes from the surface of the lens. The lens then undergoes a thorough washing to remove all abrasive materials.

The polishing operation removes any waves and scratches from the lens surface. Following the polishing operation, the lenses are sprayed on the finished side(s) with a material that protects the surface and prevents any damage during handling or storage.

The last step in the production process is the inspection, which is performed by highly trained inspectors. These inspectors are equipped with specially designed light benches to insure uniform light at all times during the inspection and use a variety of checking instruments which contribute in large measure to the precision required of ophthalmic lenses. Before being packed, the lenses are inspected one last time to check their performance against established standards for curvature, focus, and thickness.

Plastic process for conventional lenses.--The production of plastic lenses for conventional eyeglasses consists of casting and curing catalyzed liquid resin (methacrylate) in precision-ground and polished glass molds. Two-part molds are assembled in a dust-free room and are spaced by an injection-molded vinyl gasket. The gasket acts as a seal for the mold and

helps determine the thickness of the lens. The parts of the mold are clamped together to prevent any leakage. The mold is then placed in a vertical position so that any air which might be drawn into it will form a bubble at the edge of the lens where it will be least objectionable. The grinding and polishing operations involve basically the same procedure as that performed in the glass process.

Little detailed information is available on the manufacturing process for contact lenses because most major producers of such lenses consider this to be proprietary information. However, it is known that contact lenses are primarily produced from a plastic resin, polymethyl methacrylate, which all lens producers purchase from outside sources. The raw resin is extruded into a cylinder or rod, which is then sliced into pieces, forming the unfinished lens. The grinding and polishing operations for contact and conventional lenses are very similar. Unlike conventional lenses, contact lenses are finished by the manufacturer according to the specific requirements of the retailer and not by a wholesale laboratory.

U.S. Customs Treatment

Ophthalmic lenses are classifiable under TSUS Item 708.01 and are dutiable as indicated in the following tabulation:

TSUS item	Commodity	Rate of duty	
		Col. 1	Col. 2
708.01	Lenses, ophthalmic, not mounted	9.5% ad val.	40% ad val.

The column 1 rate of duty is applicable to imports from countries receiving most-favored-nation treatment, and the column 2 rate, to imports from countries designated by the President as being under Communist domination or control. 1/

The historical development of duty rates through the current rate of duty as of January 1, 1972, appears in table 1, appendix B. The table shows the reductions in the rates of duty resulting from trade-agreement concessions granted under the General Agreement on Tariffs and Trade.

Lenses covered under TSUS item 708.01 are subject to duty-free treatment from designated beneficiary developing countries under the U.S. Generalized System of Preferences (GSP) effective January 1, 1976, pursuant to Executive Order 11888, dated November 24, 1975. On two occasions, July 16, 1975, and February 10, 1976, the Optical Manufacturers Association unsuccessfully petitioned the Trade Policy Staff Committee of the Office of the Special Representative for Trade Negotiations to remove ophthalmic lenses from the

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1/ Poland, Yugoslavia, and Romania have been accorded most-favored-nation treatment by the United States.

list of articles eligible for GSP treatment. On July 14, 1978, the association filed a third petition. There have been no statutory investigations on ophthalmic lenses regarding the granting of import relief since the TSUS became effective in 1963.

The Food and Drug Administration has initiated a new program that now requires all imported medical devices, including ophthalmic lenses, to meet the same U.S. standards that are applicable to domestically produced devices.

The Domestic Market

The domestic consumer and product demand

It is estimated that more than half the persons in the United States today wear corrective lenses. The general outlook for demand in ophthalmic lenses in the future is expected to be one of continued growth for several reasons. The demographic profile of the United States has been undergoing a gradual change, with the average age of the population shifting upward. Because the need for eyeglasses is a function of age, increased life expectancy has contributed to the anticipated steadily increasing demand for them, as indicated in the following tabulation (see Federal Trade Commission's report on Advertising of Ophthalmic Goods and Services and Proposed Trade Regulations, p. 122, May 1977):

Years	Percent of persons in the age group that wear corrective lenses	Percentage of all wearers of eyeglasses
0-12	10%	4%
13-17	33%	6%
18-44	46%	35%
45-64	89%	36%
65+	93%	19%

In addition, eyeglasses and sunglasses have been successfully promoted by the industry as fashion accessories. The introduction and acceptance of the fashion concept has stimulated demand in a society of general affluency where people are enjoying the luxury of more than one pair of eyeglasses, sunglasses, contact lenses, or combinations thereof. In fact, testimony before the Federal Trade Commission in 1977 pointed out there is a significant relationship between family income level and the frequency with which eyeglasses are purchased.

U.S. consumption

Apparent U.S. consumption of ophthalmic lenses, which is principally supplied by domestic production, increased from $137.3 million in 1967 to $304.0 million in 1977 (table 2). Consumption fluctuated each year from 1967 to 1973, after which it increased steadily through 1977. The sharper decline in apparent consumption in 1972 (23 percent) than in 1968 (7 percent) and 1970

(3 percent) can be attributed mainly to a change in the classification procedure for producers' shipments of semifinished lenses. The average annual rate of increase in apparent consumption from 1972 to 1976 was 16.0 percent. The ratio of imports to consumption rose from 1.3 percent in 1967 to 7 percent in 1977.

One reason why U.S. manufacturers supply the bulk of apparent U.S. consumption is their reported superiority over foreign competitors in producing the high-quality specialized machinery required to meet the specified accuracy essential in the manufacture of ophthalmic lenses. Secondly, the domestic producer is capable of turning out significant quantities of lenses through large-scale production methods. In addition, the distribution channels are comprehensive, widespread, and efficient. Lenses are dispensed primarily through the manufacturers' exclusive wholesale laboratories and selling agents located in nearly all of the major cities throughout the United States. This places the domestic producer in an advantageous position in supplying the home market.

U.S. prices

Even though the refractive power of one's corrective lenses varies considerably from person to person, several of the larger manufacturers and the major wholesale laboratories group a vast number of possible lens combinations into one single price category. One leading producer's wholesale laboratory price range for single-vision lenses (glass and hard resin) is from $5.20 to $7.10 a pair. The retailer's cost for a pair of these lenses would vary only slightly. Although there may be millions of potential orders within a range of prescriptions, the price is virtually the same in all instances.

Pricing practices for multifocal lenses follow similar patterns. For example, the price range of one major wholesale laboratory for multifocals is from $17.50 to $21.60 a pair. However, in a recent Federal Trade Commission investigation, it was reported through several consumer surveys that retail prices of ophthalmic goods to the consumer varied as much as 100 to 300 percent for the same or substantially similar items. The consumer was not aware of the price variations, and the sellers of ophthalmic goods are prohibited by various associations from disseminating the information necessary to inform the consumer of these variations.

Lens manufacturers usually receive a 20- to 40-percent profit on those lenses sold to independent wholesale laboratories. These laboratories customarily obtain an additional 40-percent profit on lenses sold to retailers. Manufacturers' price lists for both finished-uncut lenses and semifinished blanks offer volume discounts to laboratory purchasers.

Since 1972 the Food and Drug Administration has required that all glass lenses be hardened, thus adding to the price of such lenses. Tinted or oversized lenses and severe corrections also cost the consumer more.

The trend over the past few years indicates that foreign manufacturers are becoming more sophisticated in their production techniques and are improving their technological base. Corrective lenses are imported principally from developed nations, such as France, Japan, and Canada, where overall costs are comparable with those in the United States. Nonfocus lenses are imported primarily from developing countries, mainly the Republic of Korea, where overall costs (principally wages) are significantly lower than in the United States. Obviously, lower costs permit the pricing of these imported lenses at levels more attractive to U.S. retailers.

U. S. Production

The domestic producer

Number and types of establishments.--The number of establishments producing ophthalmic lenses (SIC No. 38512) was 87 in 1972 compared with 83 in 1967, according to U.S. census data. The following tabulation, compiled from the Optical Manufacturers Directory, lists the large producers, the type of conventional lens they produce, and their locations:

Producers	Type of conventional lens	Location
American Optical Co	Glass and plastic	Southbridge, Mass.
Armorlite, Inc	Plastic	San Marcos, Calif.
Bausch and Lomb 1/	Glass	Rochester, N.Y.
Coburn Optical Industries, Inc.	Glass and plastic	Colonial Heights, Va.
Robinson-Houchin, Inc	Glass	Columbus, Ohio.
Shuron Textron	Glass and plastic	Rochester, N.Y.
Titmus Optical, Inc	do	Petersburg, Va.
Vision Ease Corp	do	St. Cloud, Minn.
Webster Lens Co	Glass	Webster, Mass.
Younger Manufacturing Co.	Glass and plastic	Los Angeles, Calif.

1/ Bausch & Lomb is the major manufacturer of soft contact lenses.

Two firms, one located in New York and the other in Massachusetts, account for the major part of domestic output. The other producing companies are located throughout the United States (table 3). In 1972, establishments in the Northeast region supplied 58 percent of total shipments, of which the New England States contributed 33 percent and the Middle Atlantic States 25 percent. Other principal producing areas were the South (22 percent) and North Central (15 percent) regions. The relative share of shipments supplied by establishments in the Northeast region increased from about 54 percent in 1967 to 58 percent in 1972, largely at the expense of shipments from establishments in the North Central and South regions. This shift was probably due to the growing consumer preference for plastic and contact lenses (over glass lenses), which the larger manufacturers located in the Northeast were able to supply.

U.S. employment and wages.--While employment for all manufacturing declined over the 10-year period 1967-77, employment in the ophthalmic lens industry increased (table 4). Total employment in the ophthalmic lens industry rose from 8,500 in 1967 to an estimated 11,200 in 1977. Production workers also increased, rising from 7,100 to 8,200. However, the ratio of production workers to total employment in the industry followed the same declining trend as in all manufacturing, because in an industrialized economy automated production methods are increasingly employed. This ratio dropped from 84 percent in 1967 to 73 percent in 1977 in the ophthalmic lens industry and 74 percent to 73 percent in all manufacturing. As would be expected with the increase in production workers, total man-hours also increased in the ophthalmic lens industry, rising from 14.3 million in 1967 to 15.3 million in 1972, or by 7 percent.

Annual average wages for production workers in the ophthalmic goods industry, which includes ophthalmic lenses, rose from $4,883 in 1972 to $6,021 in 1976, or by 23 percent. During the same period, average annual wages for all manufacturing increased from $8,043 in 1972 to $10,795 in 1976, or by 34 percent.

Production workers are generally skilled in the performance of one specific job on the production line. Bonuses are a common practice in the industry and are given to employees who produce more than their expected quota. A 40-hour work week is standard in the industry, with most employees working full time. Overtime is necessary only during peak periods.

Financial data.--There are no official data available on the financial status of the ophthalmic lens industry. However, the Optical Manufacturers Association (OMA) has published aggregated information on the profitability of its member firms, which account for approximately 85 percent of ophthalmic lens shipments in the United States. The data obtained by the OMA for 1972-76, based on the surveys of its membership, are shown below:

	1972	1973	1974	1975	1976
Net income after Federal income taxes as percentage of net sales:					
Small lens manufacturers	4.5	1/	5.7	3.9	2.3
Large lens manufacturers	8.1	6.0	2.2	5.0	7.0
Net income after federal income taxes as percentage of average assets employed:					
Small lens manufacturers	16.4	11.7	10.0	13.5	7.9
Large lens manufacturers	24.2	18.3	2.3	14.9	12.9

1/ Not available.

Although the above data show substantial differences between the profitability ratios of the small and large lens manufacturers, published data on the operations of several individual firms indicate that profitability levels also depend on the type of lens produced by the firm. Firms that specialize in contact lenses appear to be most profitable, and those that concentrate on plastic conventional lenses have higher returns than firms in the highly competitive conventional glass lens business, for which demand is stagnant. The following discussion is based on data in published annual reports of individual firms for which ophthalmic lenses represent a major part of total sales and for which separate data are presented on the sales and profitability of such lenses. While the experience of these individual companies does not necessarily typify conditions for the industry at large, inclusion of pertinent data from their annual reports does furnish insight into recent financial trends and competitive conditions.

One of the largest U.S. producers of ophthalmic articles reports data on its sales and earnings for its "vision care products," which for the most part are the products covered by this summary, and which have accounted for almost three-fourths of its annual sales in recent years. This firm's annual report shows that operating earnings as a percentage of sales for its total vision care products increased steadily from 14 percent in 1973 to 21.2 percent in 1977. Operating earnings as a percentage of sales for its soft contact lens increased steadily from 38 percent in 1973 to 45.6 percent in 1977, while the ratio for other vision care products (principally glass lenses but also including frames and sunglasses) decreased from 4.8 percent to 0.5 percent in the same period. The firm reported a 200-percent increase in the value of its sales of soft contact lenses in 1977 over 1973, while its sales of "ophthalmic

products" increased by only 17 percent in the same period. The company indicated in its 1977 report that an increasing market for soft contact lenses exists and that it is enlarging its manufacturing and distribution capacity to meet that demand. The annual report also noted that "the displacement of glass lenses by plastic has resulted in excess industry capacity for the production of glass lenses and has caused extensive price competition among manufacturers, which intensified even further in 1977."

Another large producer of ophthalmic lenses, for which the manufacture and distribution of vision products (glass and polymer multifocals, and single-vision lenses (conventional types), frames, and related optical products) accounted for about 25 percent of total net sales and revenues in 1977, reported in its 1977 annual report that the ratio of annual profit to sales of vision products in 1973-77 ranged from a profit of 8.1 percent in 1973 to a loss of 0.1 percent in 1977. The report noted, however, that the slight loss in 1977 was due to a number of diverse factors, including severe winter weather, a strike at one of its production plants, persistent problems in getting production of a new facility on stream, the costs associated with closing another plant, and purchasing specialized production equipment and inventory, as well as competitive pricing pressures.

A third, much smaller firm (sales less than $5 million) that manufactures conventional plastic lenses reported an operating profit of 26.8 percent on such operations for 1977 (the only year for which comparable data are available).

Shipment levels and trends

U.S. producers' shipments of ophthalmic lenses rose from an estimated $139.3 million in 1967 to $310.0 million in 1977 (table 2). Shipments fluctuated from 1967 to 1972, but beginning in 1973 began a steady increase continuing through 1977. The average annual rate of increase from 1972 to 1977 was approximately 15.6 percent.

Composition of shipments

Producers' shipments of ophthalmic focus lenses in the U.S. census data are broken out into subdivisions of plastic, glass, and contact lenses (table 5). Glass lenses were by far the largest category of lens type in 1967, accounting for 92 percent of the total value of shipments of ophthalmic lenses. The relative importance of glass lenses, however, dropped considerably by 1972 to 71 percent. Bifocals represented the largest portion of shipments of glass lenses in 1967 (58 percent of the value), while single-vision lenses accounted for 40 percent and trifocals made up the remainder. However, in 1972 the value of bifocals and single-vision lens shipments both shifted somewhat so that each had a 47-percent share of shipments of glass lenses. The largest increase in the price for a pair of lenses occurred with trifocals, for which the price more than quadrupled during the period.

The sharp decline in shipments of glass lenses can be attributed to the increased popularity of plastic lenses, including contacts. From 1967 to 1972, the value of shipments of plastic lenses almost tripled, and that of contact lenses rose by 213 percent. In 1967, these lenses together accounted for only 8 percent of producers' shipments, but by 1972 their share had risen to 25 percent. Industry publications indicate that shipments of plastic and contact lenses have risen substantially since.

Nonfocus lenses are of less economic significance in the lens industry than the other types of lenses treated in this summary. These lenses are designed primarily for use in the manufacture of sunglasses. Nonfocus lenses represented an estimated 4 percent of the total value of shipments in 1967 and 12 percent in 1972. This growth can best be explained by the rising popularity in eye fashion.

Channels of distribution

The ophthalmic lens industry is organized into three levels in the production/distribution chain: the manufacturers, the wholesale laboratories, and the retailers. The wholesale laboratories purchase semifinished and finished lenses from the manufacturer for distribution to three classes of optical retailers--ophthalmologists, optometrists, and opticians. Ophthalmologists are physicians who diagnose and treat all conditions relating to the eye, perform surgery and write prescriptions for drugs and corrective lenses. The optometrists are State-licensed practitioners who examine the eyes to diagnose abnormalities which affect the patient's ability to see. The opticians supply eyeglasses to consumers on the basis of written instructions from either ophthalmologists or optometrists.

Presently, there are more than 1,000 wholesale laboratories located throughout the United States, in addition to the laboratories owned by many large producers. A major portion of the laboratories' business consists of supplying the retailers with finished corrective lenses.

U.S. producers' inventories

Official U.S. statistics on producers' inventories of ophthalmic lenses are not available. However, it is known that wholesale laboratories must maintain a ready supply of finished and semimanufactured lenses in order to satisfy the retailers' needs. On the other hand, the industry maintains only a small inventory of finished noncorrective lenses. These lenses, for the most part, are kept in inventory as completed eyeglasses (i.e., sunglasses, goggles, and so forth).

U.S. Exports

Export levels and trends

Although the major U.S. lens producers have subsidiaries and/or affiliates in a number of foreign countries and account for substantial market shares in those countries, U.S. exports are significant and are growing (data on conventional lenses and contact lenses are not separately classified). They increased from 8.5 million pairs, valued at $12.3 million in 1972 to 10.1 million pairs, valued at $27.7 million, in 1977, or by about 19 percent in quantity and 125 percent in value (table 6). In terms of value, exports accounted for 8.9 percent of U.S. producers' shipments of lenses in 1977. They have consisted mostly of multivision types of lenses; contact lenses have accounted for an increasing share in recent years.

Canada has been the principal market for U.S. exports of ophthalmic lenses, accounting for between one-fourth and one-fifth of annual export sales in 1972-77. Japan, Venezuela, Brazil, Sweden, and Australia are also important markets. The unit value per pair of lenses exported trended upward during 1972-77, rising from $1.45 to $2.74. While some of this increase resulted from inflationary pressures, a large part of it was no doubt due to increasing exports of contact lenses.

Exporters

Most domestic manufacturers which export ship all types of ophthalmic lenses (glass, plastic, and contact lenses) at prices comparable with those of lenses sold domestically. U.S. exports of ophthalmic lenses are principally provided by six U.S. producers. These companies have export divisions which service foreign orders. U.S. exporters sell to foreign manufacturers of frames, wholesale laboratories, distributors, opticians, and optometrists. All necessary documents are completed by freight forwarders and/or brokers. Orders are usually shipped by sea or air freight. The price of the lenses usually includes the cost of insurance and all freight.

U.S. Imports

U.S. import levels and trends

U.S. imports of ophthalmic lenses entered under TSUS item 708.01 have consisted of a variety of types, including lenses for prescription eyewear, for sunglasses, and for goggles. Such imports increased from 7.2 million pairs, valued at $6.7 million, in 1972 to 11.9 million pairs, valued at $20.3 million, in 1977, or by about 65 percent in quantity and more than 200 percent in value (table 7). France, Japan, and Australia have been the principal suppliers of lenses; together they have supplied more than three-fourths of the imports in recent years.

The wide variation in the unit price of imported lenses (from $0.82 to $35.55 a pair in 1977) indicates that there were substantial differences from country to country in the types and quality of such lenses.

Import impact

As stated earlier, the ratio of the value of imports of ophthalmic lenses to consumption jumped from 1.3 percent in 1967 to 7 percent in 1977. Since 1972, the growth in imports of ophthalmic focus and nonfocus lenses can best be explained by the growing popularity of stylish eyewear, which has resulted in the expansion of the U.S. market.

The granting of duty-free entry to imported lenses produced in developing countries under the Generalized System of Preferences, which became effective on January 1, 1976, does not appear to have resulted in any appreciable increase in imports from those sources. Although imports from these countries increased in both 1976 and 1977 over previous levels, the share of imports supplied by the GSP countries still remained at about 5 percent. This is not surprising in view of the substantial capital investment required and the degree of technology involved in the production of ophthalmic lenses.

Importers

Most large U.S. importers of ophthalmic lenses are subsidiaries of foreign manufacturers. Most of these subsidiaries are sales offices, but in some instances they include laboratories which refine the lenses. A number of U.S. firms that produce lenses also import them in varying quantities. For the most part, the imported lenses are priced and marketed in the same manner as domestically produced lenses.

World Trade

Foreign producers

As might be expected because of the technology required and the capital intensiveness of ophthalmic lens manufacture, such production occurs mostly in the developed countries. The United States is the largest producer, accounting for about one-third of total world production. Other important producing countries are, in descending order of importance, West Germany, France, and Japan. The following is a list of the leading producing firms in each of the principal countries:

Country	Producer
France	Essilor
West Germany	Rodenstock
Japan	Hoya; Nikon
United Kingdom	UK Optical
Spain	INDO
Australia	Sola; Martin Wells

International direct investment

Three U.S. producers of ophthalmic lenses have established manufacturing and marketing facilities in both France and West Germany in order to compete more effectively in the European market; all types of ophthalmic lenses are manufactured in these establishments for distribution in the large European market. These firms, as well as other U.S. producers, have sales offices and wholesale laboratories located throughout the world. As stated earlier, some of the larger foreign producers have distribution facilities located in the United States.

Foreign customs treatment 1/

Ophthalmic lenses are provided for under heading 9001 of the Customs Cooperation Council Nomenclature (formerly the Brussels Tariff Nomenclature), and subgroup 884.11 of the Standard International Trade Classification (table 8), and are dutiable at a wide range of rates throughout the world. In 1977, nine countries accounted for approximately 97 percent of U.S. imports and six countries, for 59 percent of its exports. The following tabulation gives the current rates of duty and possible nontariff barriers to trade for the six countries that contribute the bulk of the U.S. export market.

Country	Current rate of duty	Possible nontariff barriers to trade
Canada	12.5% ad val. 1/	None.
Japan	6.0% ad val.	None.
Venezuela	5.0% ad val.	3.5% ad val. tax on goods imported by land, sea, or air; 1% ad val. on goods imported by parcel post.
Sweden	Free	None.
Brazil	39.0% ad val. (multifocal, bifocal and trifocal lenses); 37.0% ad val. (all other types of ophthalmic lenses).	15% excise tax on dutiable value. A deposit representing 100 percent of the f.o.b. value must be deposited in a bank for 1 year without interest being paid.
Australia	20% ad val.	None.

1/ In effect until June 30, 1979, at which time the rate will increase to 17.5%.

1/ Information in this section has been obtained from a number of sources and its accuracy cannot be assured. Many countries change tariff duties and other factors affecting trade quite frequently. Authoritative information, if desired, should be obtained from the appropriate foreign government.

Despite aggressive advertising programs and other efficient marketing techniques by U.S. manufacturers of ophthalmic lenses, U.S. exports in recent years have not been growing as rapidly as in previous years. While the decline in export growth may be due in part to high tariffs and restrictive trade practices such as sales taxes, deposit requirements, and surcharges in some foreign countries, it no doubt also results from the tendency on the part of some U.S. firms to supply foreign markets through their local affiliates or subsidiaries.

The following is a list of other selected countries and their respective rates of duty on ophthalmic lenses:

Country	Current rate of duty
Common Market (U.K, Ireland, Belgium, France, Netherlands, West Germany, Italy, Denmark, and Luxembourg).	14%.
Finland	Free.
Switzerland	60 francs per 100 kg.
Austria	15% or 980 schillings per 100 kg., whichever is less.
Spain	Multifocal and bifocal, 25%; others, 22.5%.
Mexico	20% + 2% surcharge tax.
Central America (Guatemala, Salvador, Nicaragua, Costa Rica, Honduras).	$1 per kg., + 10% 1/
Panama	10%.
Ecuador	25%.
Peru	42% + 20% sales tax per kg.
Chile	27% + 3% freight charge.
Argentina	70%.
Uruguay	84%.
Jamaica	30%.
Trinidad	30%.
Haiti	15%.
Netherlands Antilles	4.5%.
Hong Kong	Free.
Republic of Korea	40%.
Taiwan	40%.
Philippines	20% + 125% sales tax.
Singapore	Free.
New Zealand	5%.
Israel	14%.
Egypt	15%.
Iran	30%.
India	60% + 15% surcharge tax.
Pakistan	45%.
South Africa	Free.

1/ All listed countries have additional 30% surcharge taxes, except Honduras.

Source: Optical Manufacturers Association and Bureau of International Commerce, U.S. Department of Commerce.

Appendix A

Excerpts from the Tariff Schedules of the United States Annotated (1978)

GSP	Item	Stat. Suf-fix	Articles	Units of Quantity	Rates of Duty 1	Rates of Duty 2
			Subpart A. - Optical Elements, Spectacles, Microscopes, and Telescopes, Optical Goods Not Elsewhere Provided For			
			Subpart A headnotes:			
			1. The provisions for optical elements in this subpart do not cover -- (i) unmounted optical elements of glass or synthetic optical crystals unless such elements have been optically worked (see part 3A of schedule 5); (ii) plates or sheets of polarizing material unless cut to shape or mounted (see part 3A of schedule 5); (iii) photographic filters (see subpart F of this part)			
			2. The term "optically worked", as used in this subpart, means that the glass or the synthetic optical crystals have been subjected to grinding or polishing incident to surface shaping for producing optical properties.			
			3. The provisions for mounted optical elements cover such elements when in a permanent frame or other mounting suitable for fitting to an apparatus or instrument and do not include mounted elements which are themselves separate instruments or apparatus such as spectacles, medical or dental mirrors, and hand magnifying glasses.			
			4. Sets comprised of tools, implements, and other articles fitted into and imported with cases containing microscopes provided for in item 708.71, and ordinarily sold at retail, and used, in conjunction with such microscopes, are classifiable therewith.			

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GSP	Item	Stat. Suf-fix	Articles	Units of Quantity	Rates of Duty 1	Rates of Duty 2
			Lenses, prisms, mirrors, and other optical elements, all of the foregoing whether mounted or not mounted:			
			Not mounted:			
			Lenses:			
A	708.01		Ophthalmic	.....	9.5% ad val.	40% ad val.
		20	Contact	Pcs.		
		40	Other	Pcs.		
A	708.03	00	Other	No.....	14% ad val.	45% ad val.
A	708.05	00	Prisms	X.....	20% ad val.	65% ad val.
A	708.07	00	Mirrors	X.....	20% ad val.	45% ad val.
A	708.09	00	Other	X.....	21% ad val.	85% ad val.
			Mounted:			
			Lenses:			
A	708.21	00	Projection	No.....	17.5% ad val.	45% ad val.
A	708.23		Other	.....	12.5% ad val.	45% ad val.
		20	Photographic	No.		
		40	Other	No.		
A	708.25	00	Prisms	X.....	20% ad val.	65% ad val.
A	708.27	00	Mirrors	X.....	20% ad val.	45% ad val.
A	708.29	00	Other	X.....	21% ad val.	65% ad val.
			Eyeglasses, lorgnettes, goggles, and similar articles, all the foregoing whether used for corrective, protective, or other purposes; frames and mountings for any of the foregoing, and parts of such frames and mountings:			
A	708.41	00	Lorgnettes	X.....	22.5% ad val.	45% ad val.
			Other (except frames and mountings, and parts thereof):			
A	708.43	00	Valued not over $2.50 per doz	Doz.....	13% ad val.	60% ad val.
A	708.45		Valued over $2.50 per doz	.....	1.5% ad val.	60% ad val.
		20	Sunglasses and sun goggles	Doz.		
		30	Other	Doz.		
A	708.47		Frames and mountings, and parts thereof	.....	15% ad val.	50% ad val.
		20	Frames and mountings (complete units)	Obs.		
		40	Other	X		
			Refracting or reflecting telescopes, whether monocular or binocular; astronomical instruments not specially provided for; frames and mountings for any of the foregoing articles, and parts of such frames and mountings:			
			Telescopes:			
			Not designed for use with infra-red light:			
A	708.51	00	Field glasses and opera glasses (except prism binoculars)	No.....	8.5% ad val.	45% ad val.
A	708.52	00	Prism binoculars	No.....	20% ad val.	60% ad val.
A	708.53	00	Other	No.....	20% ad val.	45% ad val.
A	708.55	00	Designed for use with infra-red light	No.....	3.5% ad val.	35% ad val.
A	708.57	00	Astronomical instruments not specially provided for	No.....	22.5% ad val.	45% ad val.
A	708.59	00	Frames and mountings, and parts thereof	X.....	The column 1 rate applicable to the article of which the frames and mountings are parts	The column 2 rate applicable to the article of which the frames and mountings are parts

Note: For explanation of the symbol "A" or "A*" in the column entitled "GSP", see general headnote 3(c).

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Appendix B

Statistical Tables

Table 1.--Lenses, ophthalmic, not mounted: U.S. rates of duty, Aug. 31, 1963, to present

(Percent ad valorem)

TSUS item No.	Description	Authorization and effective date of rate change	Rate of duty	
			Col. 1	Col. 2
708.01	Lenses, ophthalmic, not mounted.	Adoption of TSUS; Aug. 31, 1963	19%	40%
		Pres. Proc. 3822 (Kennedy round), Jan 1--		
		1968	17%	40%
		1969	15%	40%
		1970	13%	40%
		1971	11%	40%
		1972	9.5%	40%

Table 2.--Ophthalmic lenses, not mounted: U.S. producers' shipments, exports, imports, and apparent consumption, 1967-77

Year	Producers' shipments 1/	Exports	Imports	Apparent consumption	Ratio of imports to	
					Consumption	Producers' shipments
	1,000 dollars				Percent	Percent
1967	139,300	3,822	1,836	137,314	1.3	1.3
1968	130,100	4,949	2,426	127,577	1.9	1.9
1969	154,800	7,093	3,289	150,996	2.2	2.1
1970	151,300	8,088	3,664	146,876	2.5	2.4
1971	193,800	9,470	4,195	188,525	2.2	2.2
1972	150,400	12,318	6,696	144,778	4.6	4.5
1973	209,200	18,219	8,855	199,836	4.4	4.2
1974	235,000	20,945	10,633	224,688	4.7	4.5
1975	258,700	20,387	12,200	250,513	4.9	4.7
1976	295,000	23,938	16,686	287,748	5.8	5.7
1977	310,000	27,711	21,738	304,027	7.2	7.1

1/ Estimated on the basis of official statistics of the U.S. Department of Commerce.

Source: Compiled from official statistics of the U.S. Department of Commerce, except as noted.

Table 3.--Ophthalmic focus lenses, including contact lenses: U.S. producers' shipments, by geographic areas, 1967 and 1972

(Value in millions of dollars)

Area	1967	1972	Percentage change 1972 from 1967
	Value		
United States, total	134.2	134.5	0.2
Northeast region, total	72.7	78.1	7.4
New England division	1/	44.3	1/
Middle Atlantic division	1/	33.8	1/
North Central region, total	22.2	20.6	-7.2
East North Central division	7.6	10.0	31.6
West North Central division	14.6	10.6	-27.4
Minnesota	10.6	7.4	-30.2
South region	34.8	30.0	-13.8
West region	4.5	5.8	28.9
	Percent of total		
United States, total	100.0	100.0	-
Northeast region, total	54.2	58.1	-
New England division	2/	32.9	2/
Middle Atlantic division	2/	25.1	2/
North Central region, total	16.5	15.3	-
East North Central division	5.7	7.4	-
West North Central division	10.9	7.9	-
Minnesota	7.9	5.5	-
South region	25.9	22.3	-
West region	3.4	4.3	-

1/ Data are withheld to avoid disclosure of operations of individual companies; however, the New England division represented more than $50.0 million in shipments, and the Middle Atlantic division represented $5.0 million to $20.0 million in shipments.

2/ Not available.

Source: Census of Manufactures, 1967 and 1972.

Note.--Because of rounding, figures may not add to the totals shown.

Table 4.--Average number of employees, total and production workers, in all manufacturing and in the ophthalmic lens industry, 1967-77

Year	All manufacturing			
	All employees		Production workers	
	Number	Change from previous year	Number	Ratio to total employment
	Thousands	Percent	Thousands	Percent
1967	19,447	-	14,308	73.6
1968	19,781	1.7	14,514	73.4
1969	20,167	2.0	14,767	73.2
1970	19,349	-4.1	14,020	72.5
1971	18,572	-4.2	13,467	72.5
1972	19,090	2.8	13,957	73.1
1973	20,068	5.1	14,760	73.5
1974	20,046	-.1	14,513	72.9
1975	18,347	-8.5	13,070	71.2
1976	18,944	3.3	13,621	71.9
1977	19,357	2.2	14,062	72.7
	Optical lens industry 1/			
	All employees		Production workers	
	Number	Change from previous year	Number	Ratio to total employment
	Thousands	Percent	Thousands	Percent
1967	8.5	-	7.1	83.5
1968	8.4	1.2	6.9	82.1
1969	8.6	2.4	7.1	82.6
1970	9.5	10.5	7.6	80.0
1971	9.8	3.2	7.7	78.6
1972	9.9	1.0	7.7	77.8
1973	9.3	-6.1	7.6	81.7
1974	10.0	7.5	7.9	79.0
1975	9.5	-5.0	7.3	76.8
1976	10.4	9.5	7.6	73.1
1977	11.2	-7.7	8.2	73.2

1/ Data for noncensus years (1968-71 and 1973-77) were estimated on the basis of official statistics of the U.S. Department of Commerce.

Source: Employment and Earnings, United States, 1909-1975, Census of Manufactures, and Annual Survey of Manufactures.

Table 5.--Lenses, ophthalmic, not mounted: U.S. shipments, by types, 1967 and 1972

Product	1967	1972
	Quantity (1,000 pairs)	
Ophthalmic focus lenses, including contact lenses--	60,600	1/
Plastic lenses	10,600	1/
Contact lenses	1,000	2,300
Glass single-vision lenses (ground and polished and molded blanks)	30,800	25,600
Glass multifocal lenses (finished and semi-finished and molded blanks:		
Bifocals	16,700	13,100
Trifocals and double segments	1,500	800
Ophthalmic focus lenses, including contact lenses, n.s.k	1/	1/
Nonfocus fashion tinted lenses, plastic and glass--	1/	1/
	Value (1,000 dollars)	
Ophthalmic focus lenses, including contact lenses--	134,200	134,500
Plastic lenses	4,000	11,100
Contact lenses	7,200	22,500
Glass single-vision lenses (ground and polished and molded blanks)	49,100	45,200
Glass multifocal lenses (finished and semi-finished and molded blanks):		
Bifocals	71,600	45,400
Trifocals and double segment	2,100	5,200
Ophthalmic focus lenses, including contact lenses, n.s.k	300	5,100
Nonfocus fashion tinted lenses, plastic and glass--	2/ 5,100	15,900
	Unit value per pair	
Ophthalmic focus lenses, including contact lenses--	$2.22	1/
Plastic lenses	.38	1/
Contact lenses	7.20	$9.78
Glass single-vision lenses (ground and polished and molded blanks)	1.59	1.77
Glass multifocal lenses (finished and semi-finished and molded blanks):		
Bifocals	4.29	3.47
Trifocals and double segments	1.40	6.50
Ophthalmic focus lenses, including contact lenses, n.s.k	1/	1/
Nonfocus fashion tinted lenses, plastic and glass--	1/	1/

1/ Not available.

2/ Estimated on the basis of official statistics of the U.S. Department of Commerce.

Source: Compiled from official statistics of the U.S. Department of Commerce, except as noted.

Table 6.—Lenses, ophthalmic, not mounted: U.S. exports, by principal markets, 1972-77

Market	1972	1973	1974	1975	1976	1977
	Quantity (1,000 pairs)					
Canada	2,126	3,010	2,877	1,588	1,919	2,602
Japan	604	759	749	355	430	407
Venezuela	345	242	277	435	552	523
Brazil	366	394	435	230	348	543
Sweden	89	143	200	175	270	254
Australia	298	383	720	187	371	304
All other	4,668	6,368	5,930	4,831	4,434	5,469
Total	8,496	11,299	11,188	7,795	8,324	10,102
	Value (1,000 dollars)					
Canada	$2,757	$3,774	$5,020	$5,481	$6,379	$8,394
Japan	1,237	1,566	2,343	1,814	2,090	2,639
Venezuela	357	462	632	872	1,407	1,287
Brazil	722	878	994	936	1,285	1,797
Sweden	166	347	542	827	1,231	1,325
Australia	437	694	936	617	1,180	1,009
All other	6,642	10,490	10,479	9,839	10,367	11,260
Total	12,318	18,220	20,946	20,386	23,939	27,711
	Unit value (per pair)					
Canada	$1.30	$1.25	$1.75	$3.45	$3.32	$3.23
Japan	2.05	2.06	3.13	5.11	4.86	6.48
Venezuela	1.06	1.92	1.45	2.01	2.55	2.46
Brazil	1.97	2.29	2.29	4.07	3.69	3.31
Sweden	1.87	2.43	2.71	4.73	4.56	5.22
Australia	1.47	1.81	1.30	3.30	3.18	3.32
All other	1.42	1.65	1.77	2.04	2.34	2.06
Average	1.45	1.61	1.87	2.62	2.88	2.74
	Percent of total value					
Canada	22.4	20.7	24.0	26.9	26.6	30.3
Japan	10.0	8.6	11.2	8.9	8.7	9.5
Venezuela	2.9	2.5	3.0	4.3	5.9	4.7
Brazil	5.9	4.8	4.7	4.6	5.4	6.5
Sweden	1.3	1.9	2.6	4.1	5.1	4.8
Australia	3.5	3.8	4.5	3.0	4.9	3.6
All other	53.9	57.6	50.0	48.3	43.3	40.6
Total	100.0	100.0	100.0	100.0	100.0	100.0

Source: Compiled from official statistics of the U.S. Department of Commerce.

Note.—Because of rounding, figures may not add to the totals shown; unit values and percents calculated from the unrounded figures.

Table 7.—Lenses, ophthalmic, not mounted: U.S. imports for consumption, by principal sources, 1972-77

Source	1972	1973	1974	1975	1976	1977
	Quantity (1,000 pairs)					
France	1,632	1,337	1,410	1,993	3,064	4,870
Japan	3,555	4,015	4,058	3,295	4,673	3,796
Australia	1,043	1,153	458	1,000	1,427	1,391
Canada	0	411	451	416	353	362
West Germany	38	69	91	151	34	20
United Kingdom	66	250	162	236	25	161
Portugal	0	0	0	35	317	339
Italy	207	117	263	214	269	261
Republic of Korea	82	151	315	265	339	292
All other	604	568	565	463	386	444
Total	7,227	8,071	7,773	8,068	10,887	11,936
	Value (1,000 dollars)					
France	$2,210	$1,928	$2,952	$4,069	$5,158	$9,162
Japan	2,829	4,136	3,699	3,233	4,382	4,207
Australia	674	759	480	999	2,395	3,120
Canada	-	742	1,390	914	1,419	1,062
West Germany	27	94	114	146	444	711
United Kingdom	56	109	223	233	581	513
Portugal	-	-	-	20	204	321
Italy	111	103	346	337	293	317
Republic of Korea	62	113	241	185	230	238
All other	727	858	976	687	587	620
Total	6,696	8,842	10,451	10,883	15,693	20,271
	Unit value (per pair)					
France	$1.35	$1.44	$2.09	$2.11	$1.68	$1.88
Japan	.80	1.03	.91	.98	.94	1.11
Australia	.65	.66	1.05	1.00	1.68	2.24
Canada	-	1.80	3.08	2.34	4.02	2.93
West Germany	.71	1.36	1.25	.97	13.06	35.55
United Kingdom	.85	.44	1.38	.99	23.24	3.19
Portugal	-	-	-	.57	.64	.95
Italy	.54	.88	1.32	1.58	1.09	1.22
Republic of Korea	.76	.75	.77	.70	.68	.82
All other	1.20	1.51	1.73	1.48	1.52	1.40
Average	.93	1.10	1.35	1.35	1.44	1.70

Source: Compiled from official statistics of the U.S. Department of Commerce.

Note.—Intraocular lenses from the Netherlands were misclassified under TSUS item 708.01 during 1973-77. This type of lens is considered an orthopedic appliance and should have been classified under TSUS item 709.57. The quantity and value totals above have been modified to reflect this change in classification. The U.S. Customs Service has corrected this problem in the 1978 import statistics.

Table 8.--Lenses, ophthalmic, not mounted: TSUSA numbers, Schedule B numbers, SIC numbers, SITC number, and CCCN (BTN) number included in this commodity group

TSUSA item No.	Schedule B No.	SIC No.	SITC No.	CCCN (BTN) No.
708.0120	708.0120	3851223	884.11	90.01
.0140	708.0140	3851225		
(formerly	(formerly	3851227		
708.0100)	861.1110):	3851231		
		3851241		
		3851243		
		3851200		
		3851391		

SUMMARIES OF TRADE AND TARIFF INFORMATION

USITC Publication

Complete list of Summaries published to date in Schedule 7

Control No.	Title	Control No.	Title
7-1-1	Luggage		
7-9-2	Fireworks		
7-2-3	Physical Testing Instruments		
7-10-4	Writing Instruments		
7-3-5	Pianos and Other Keyboard Stringed Instruments		

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1. Lenses. 2. Glass, optical. I Title.